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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Michael D. Peterson et al.

Examiner: Robin Annette Hylton

Serial No.: 09/658,374

Group Art Unit: 3727

Filed: September 8, 2000

Title: CORROSION RESISTANT VENTS WITH INTEGRAL FILTER

APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231

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Sir:

Further to the Notice of Appeal filed October 17, 2003, herewith are three copies of Appellant's Brief on Appeal. A check for the statutory fee of \$165.00 fee for filing an Appeal Brief and the \$55.00 fee for a one-month extension of time is enclosed. This is an appeal from the third decision of the Examiner dated June 17, 2003 rejecting all of Appellant's claims, the second rejection having been the Final Rejection of December 2, 2002.

(1) REAL PARTY IN INTEREST

The real party in interest in the present application is Nuclear Filter Technology, Inc., to whom the present application is assigned, the Assignment being recorded November 8, 2000, at Reel 011271, Frame 0682.

(2) RELATED APPEALS AND INTERFERENCE

There are no known related appeals or interferences.

(3) STATUS OF THE CLAIMS

Claims 1-13 and 15-20 have been rejected under 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement.

Claim 1 is rejected under the judicially created doctrine of obviousness-type-double patenting as being unpatentable over claim 1 of U.S. Patent 6,413,304 to Wickland et al. in view of Kalota and Finkelstein or McKedy.

Claim 1 is also rejected under the judicially created doctrine of obviousness-type-double patenting as being unpatentable over claim 1 of U.S. Patent 6,395,050 to Wickland et al. in view of Kalota, Finkelstein or McKedy.

Claims 1, 2, 7 and 18-20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Brassell et al. '328 in view of Kalota '369 and Finkelstein '930 or McKedy '593.

Claims 3-7 and 15 have been rejected under 35 U.S.C. §103(a) as unpatentable over the prior art as applied to claims 1 and 9 and further in view of Wickland et al. '707.

Claims 9 and 11 have been rejected under 35 U.S.C. §103(a) as unpatentable over the prior art applied with respect to claim 8 and further in view of Seibert et al. '949.

Claims 1, 2, 12, 13 and 18-20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Brassell '669 in view of Brassell '328, Kalota '369 and Finkelstein '931 or McKedy '539.

Claims 3-7 and 15 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the prior art applied to claims 1 and 19 and further in view of Wickland '707.

Claims 8, 10, 16 and 17 have been rejected as unpatentable over the prior art as applied to claims 7 and 15 further in view of Carpinella '700.

Claims 9 and 11 have been rejected under 35 U.S.C. §103(a) as unpatentable over the prior art as applied to claim 8 and further in view of Seibert '949.

Claim 1 has been again rejected under 35 U.S.C. §103(a) as obvious in view of Wickland '304 in view of Kalota '369.

Claim 1 is further rejected as obvious over Wickland '050 in view of Kalota '369 and Finkelstein '931 or McKedy '593.

(4) STATUS OF AMENDMENTS AFTER FINAL

The amendment of March 17, 2003 filed with the RCE, which was the last Amendment submitted in this application, has been entered.

(5) SUMMARY OF THE INVENTION

Appellants' invention is directed to an enclosure vent to vent hydrogen gas while controlling the release of volatile, organic compounds from an enclosure containing transuranic (radioactive) waste to an environment surrounding the enclosure. The vent is resistant to corrosion for corrosive materials which include chlorinated solvents, hydrochloric acid and nitric acid. The vent comprises a housing 18 defining a chamber 26 having a first opening at the first end 20 which communicates

with the enclosure 10 and a second opening which communicates with the surrounding environment through the circular openings 54. The housing is made of a nickel, chromium, molybdenum alloy generally known as HASTELLOY® 22® which has a resistance to corrosion from the aforementioned corrosive elements for at least two-hundred years.

A filter media 16 is disposed within the chamber 26 between the first and second openings at 20 and 54 for venting hydrogen gas from the container 10. The filter media 16 is a carbon-to-carbon filter media providing a hydrogen permeability greater than $10 \text{ E-06 mol/S/mol}$ fraction weight, having a removal of 0.45 micron particles exceeding 99.00% at an air flow capacity less than 2.000 ml/min at a pressure differential less than 1.0 inch.

Between the filter media 16 and the housing 18, a seal 30 is disposed. The seal 30 consists of direct engagement between the nickel, chromium, molybdenum alloy of the housing 18 and the carbon-to-carbon filter media 16. As is evident from Figs. 3 and 8 there are no other structures disposed between the housing 18 and the filter media 16.

In a more specific aspect of the invention, the direct engagement of the filter media 16 with the alloy comprising the housing 18 is accomplished by the annular knife seal 32 which penetrates a bottom surface 29 of the filter media. At page 4, lines 19-23 of the specification this penetration is supported by the following recitation:

The shoulder 28 has a sharp annular edge 30 defined by a slightly conical portion of the shoulder which bites into the bottom surface 29 of the filter element to provide a knife edge seal 36 so that the first end of the housing is sealed with respect to the filter media 16 (emphasis supplied).

Since the vent must last for two-hundred years, the housing of the vent has an average corrosion rate no great than 2mls. per year when immersed in hydrochloric acid at a concentration of 2.0 to 2.5% by

weight and a temperature of 90EC an average corrosion rate of no greater than 2mls. per year when immersed in a solution of nitric acid and 15.8% hydrochloric acid at a concentration of 8.8% by weight and at a temperature of 52EC. In still a further aspect of the invention, the knife edge 30 is on an annular shoulder 28 and the vent includes a peripherated lid 44 having a plurality of openings 54. In still a further aspect of the invention, the peripherated lid 44 is made of the same material as the housing 18 and is welded thereto.

A copy of all the pending claims is presented in the Appendix.

(6) ISSUES

(1) Do claims 1-13 and 15-20 fail to comply with the written description requirement of 35 U.S.C. § 112 because the original disclosure does not recite that the filter media is being sealed by "direct contact" with the housing?

(2) Is the rejection of claim 1 under the judicially created doctrine of obviousness-type double patenting as unpatentable over claim 1 of U.S. Patent 6,413,304 or over claim 1 of U.S. Patent 6,395,050, with either patent considered in view of Kalota '369, Finkelstein, '931 or McKedy '593, a proper rejection?

(3) Are Appellant's claims 1, 2, 7 and 18-20 unpatentable over Brassell et al. '328 in view of Kalota et al. '369 and Finkelstein et al. '931 or McKedy '593 with the remaining claims being unpatentable over this rejection further in view of Wickland et al. '707, Carpinella '700 or Seibert et al. '949?

(4) Are claims 1, 2, 12, 13 and 18-20 unpatentable over Brassell et al. '669 in view of Brassell '328 and Kalota et al. '369, Finkelstein et al. '931 or McKedy '593?

(5) Is claim 1 patentable over combinations of references relying on Wickland '304 or '050 as primary references?

(7) GROUPING OF THE CLAIMS

None of the claims stand or fall together.

(8) APPELLANTS' ARGUMENTS

Rejection Under 35 U.S.C. §112, first paragraph:

Claims 1-13 and 15-20 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with a written description requirement because according to the rejection there is no disclosure as originally filed for a filter media being sealed by "direct contact" with a housing. Appellants respectfully submit that this rejection is unsupportable because both Fig. 3 and Fig. 8, as filed, disclose direct contact between the housing 18 and the filter media 16. Clearly, Figs. 3 and 8 are part of the application as originally filed and are therefore part of the original "written description." At page 4, lines 19-24 of the specification as originally filed, Appellants state the following:

The shoulder 28 has a sharp angular edge 30 defined by a slightly conical portion 32 of the shoulder which bites into the bottom surface 29 of the filter element 16 to provide a knife edge seal so that the first end of the housing is sealed with respect to the filter media. Consequently all of the gases, liquids and solid particles within the drum 10 which pass through the vent must pass through the filter element 16.

Reference to Fig. 3 shows no other structural element disposed between the filter media 16 and the housing 18, yet there is a seal therebetween. Consequently, there is clearly illustrated in Fig. 3, when considered with the aforementioned text on page 4, lines 19-24, of the specification there is disclosure of direct contact which is readily apparent to one skilled in the art. Furthermore, it is recited on page 6, lines 18-19 in describing Fig. 8 that:

"the filter element 16' is received in a cylindrical chamber 26' and is seated against a sharp edge 30' on a shoulder 28'."

Fig. 8 shows no other structural element between the housing of Fig. 8 and the insert 16. Consequently, there must be direct contact if there is a seal.

Further with respect to this issue, the comparative examples are further indicative that there is direct contact in Appellant's invention. In comparative example 1, the vent fails because epoxy sealant is used. In comparative example 2, a vent fails which has a housing of 316 stainless steel, which is of course different from Appellant's claimed invention in which Appellants use a housing made of a nickel, chromium, molybdenum alloy exemplified by HASTELLOY® C-22®.

In comparative example 3, a carbon-to-carbon filter element is tested without a stainless steel housing and lid in a twelve molar HCl environment. This filter element shows no plugging, which indicates that the proximity of the stainless steel housing and lid caused plugging of the filter media. By using the HASTELLOY® 22® alloy in proximity with the carbon-to-carbon filter element with no intervening seal, i.e., a seal "consisting of direct contact", the vent is not compromised by corrosion for at least two-hundred years, which is sufficient time for corrosive materials within the transuranic sample to vent from the container.

It is respectfully submitted that Appellants disclosure as filed provides sufficient written description to support a seal by "direct contact" so as to reasonably convey to one skilled in the relative art that the inventors, at the time the application was filed, had possession of the claimed invention.

Double Patenting Rejections:

While Appellants do not agree with the obviousness-type double patenting rejection, Appellants file herewith two Terminal Disclaimers, obviating the rejections based on U.S. Patent Nos. 6,413,304 and 6,395,050 in order to reduce the issues on appeal. Appellants therefore respectfully request that these rejections be withdrawn.

Claim Rejections Under 35 U.S.C. §103:

Claims 1, 2, 7 and 18-20 have been rejected under 35 U.S.C. §103a as being unpatentable over Brassell '328 in view of Kalota et al. '369 and Finkelstein et al. '931 or McKedy '593. It is respectfully requested that the Board reverse this rejection because no *prima facie* case of obviousness is established by this combination of references.

As the Examiner admits, Brassell '328 is silent regarding both the recited material of the housing and the recited "seal consisting of direct engagement between the nickel-molybdenum chromium alloy of the housing and the carbon-to-carbon filter media." But not only does Brassell '328 not include these limitations of Applicants independent claims 1 and 19, it includes the following recitation at paragraph 8, lines 23-32:

"Of course, in any use, the filter one of this invention must be properly sealed into the container 2 or other system component in which it is employed. A particularly preferred sealant is RTV high temperature silicone (EGRTV1116 high temperature sealant) which provides desired properties even for radioactive applications. It is further provided that the filter be covered with a conventional perforated metal cover 3 such as 22 gauge mild steel. See Fig. 1."

So not only does the primary reference, Brassell '328, lack at least two limitations of the claimed invention but it also teaches away from the claimed invention in that it states that a preferred sealant is used to properly seal the carbon-to-carbon filter element in the container.

It is respectfully submitted that neither the secondary reference Kalota et al. '369 nor either of the tertiary references Finkelstein et al. '931 or McKedy '593 cure the deficiencies of Brassell '328 as a reference against Appellant's claimed invention. Considering first Kalota et al. '369, Kalota et al. does teach that it is known to provide corrosion resistant vessel made of nickel-molybdenum chromium alloy as is set forth in column 3, lines 7 and 8. Kalota does not teach a housing for filter media wherein the filter media is a carbon-to-carbon filter media and the housing is made of the alloy required by the limitations of independent claims 1 and 19. There is no suggestion in Kalota et al. '369 that one would achieve Appellants' claimed desired result of resistance of corrosion when exposed to gases from transuranic waste for a time period of at least 200 years. Moreover, there is no disclosure in Kalota et al. '369 of direct contact between a carbon-to-carbon filter media and a nickel, molybdenum, chromium alloy surface. These differences are only taught by Appellant's disclosure. It is only with Appellants disclosure present that one skilled in the art would make the claimed combination of Brassell et al. '328 and Kalota et al. '369. The rejection recognizes this difference and turns to either Finkelstein '931 or McKedy '593 to cure this deficiency in the Brassell et al. '328 - Kalota et al. '369 combination.

Finkelstein et al. '931 does not cure the deficiency because Finkelstein et al. '931 is directed to a high-barrier closure liner for carbonated beverage containers and the like, wherein the purpose is not to vent a beverage container but to keep a beverage container sealed. In Finkelstein et al. '931 non-porous sealing elements are retained in tight engagement with a container such as a bottle with a screw cap closure having a closer liner 102 that has gas barrier layers. While the gas barrier layers are in direct contact with the bottle closure, they are in direct contact for the purpose of preventing gas from venting from the bottle. This is just the opposite of Appellant's claimed invention where a porous filter media is provided to allow gas to vent from a container. Substantially all seals for holding gas in a container sealed by direct contact with another solid surface. However, there are no disclosures of a carbon-to-carbon filter media being sealed by direct contact with a nickel, molybdenum, chromium housing, which Appellants claim. There is absolutely no suggestion in Finkelstein et al. that by having direct contact between a housing and a filter media to affect a seal between the housing and the filter media that an enclosure vent for venting hydrogen gas from an enclosure containing transuranic waste will have an increased life (of 200 years) which is the purpose of Appellant's claimed invention.

McKedy '593 is directed to an oxygen absorbing liner 12 which absorbs oxygen disposed on the inner surface of a cap 11. It is apparently cited as a teaching of direct contact between a vent housing and a filter media, but there is neither a filter media nor a vent disclosed in McKedy. Moreover, there is clearly no suggestion that direct contact between a carbon-to-carbon filter media and a nickel, molybdenum, chromium alloy housing increases the life of a vent the purpose of which is to filter hydrogen gas exiting from stored transuranic waste.

Clearly, there is no teaching or suggestion in any of these references absent Appellants' own disclosure to suggest to one skilled in the art that the secondary references might be combined with Brassell et al. '328 to create a useful article. Accordingly, it is respectfully requested that this rejection be reversed by the Board.

Claims 3-7 and 15 have been rejected under 35 U.S.C. §103(a) as unpatentable over the prior art as applied to independent claims 1 and 19 further in view of Wickland '707. In that Wickland '707 does not cure the deficiencies of the other references of this combination as a reference against Appellant's claims, claims 3-7 and 15 are patentable for the same reasons as claims 1 and 19. It should be noted that Wickland et al. '707 recites in Fig. 3 that, "if the disk 68 is made of carbon-to-carbon, it is adhered by adhesive disposed between the cylindrical periphery 70 thereof and the cylindrical wall surface 72 of the cavity". Accordingly, it is respectfully requested that this rejection be reversed.

Claims 8, 10, 16 and 17 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the prior art as applied to claims 7 and 15 further in view of Carpinella '700. Appellants respectfully request that this rejection be reversed in that Carpinella does cure the deficiencies of the prior art applied to claims 1 and 19 upon which claims 7 and 15 depend.

Claims 9 and 11 have been rejected under 35 U.S.C. §103(a) as unpatentable over the prior art as applied to claim 8 and further in view of Seibert et al. '949. Again, claims 9 and 10 include the recitations of claim 1 and are therefore patentable over the prior art for the same reasons as claim 1. Accordingly, it is respectfully requested that this rejection be reversed in that Seibert et al. does not cure the aforementioned deficiencies in claim 1.

Claims 1, 2, 12, 13 and 18-20 have been rejected under 35 U.S.C. §103(a) as unpatentable over Brassell et al. '669 in view of Brassell et al. '328 and Kalota and Finkelstein or McKedy. Appellant respectfully requests that this rejection be reversed because, as the Examiner admits the "disclosed and closure vent does not have the structure of that claimed and is silent regarding the material of the housing."

In that Brassell et al. '669 does not have the structure claimed, how can it be a primary reference? Appellants respectfully submit that the rejection then begins to build the structure claimed from an array of desperate references. Appellants have previously discussed and incorporate herein the arguments with respect to Brassell et al. '328, Kalota, Finkelstein and McKedy. It is respectfully submitted that if the combination of references in paragraph 8 reiterated in this rejection, do not result in a viable rejection of Appellant's claims, then the addition of Brassell '669 which does not have the structure of that claimed and is silent regarding the material of the housing adds nothing to the rejection previously traversed and therefore should be reversed.

With respect to claims 12, 13, 3-7, 15, 8, 10, 16, 17, 9 and 10, each of these claims are patentable for the same reasons as independent claims 1 and 19. Accordingly, it is respectfully requested that the rejection of these claims be reversed. Again, as admitted in the rejection Brassell, '669 does not have the structure of that claimed and is silent regarding the material of the housing and therefore adds nothing to the rejection of Appellant's claims as set forth in paragraph 8.

Claim 1 has been rejected under 35U.S.C. §103(a) as being obvious over Wickland '304 in view of Kalota and Finkelstein or McKedy. Appellants respectfully submit that Wickland et al. '304 was filed September 8, 2000 and Appellant's application was filed on September 8, 2000. Since these applications were filed on the same day, Wickland '304 is not a proper reference against

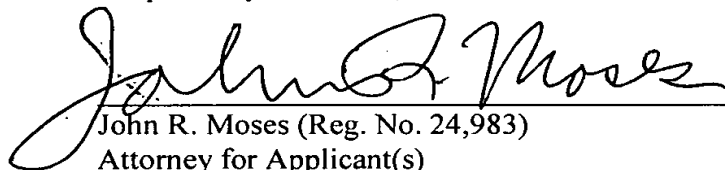
Appellants' claims since 35 U.S.C. §102(e) requires that the invention was described in a patent granted on an Application for patent by another filed in the United States "before the invention thereof by Applicant for patent". Accordingly, it is respectfully requested that this rejection be reversed by the Board.

Claim 1 was still further rejected under 35U.S.C. §103(a) as obvious over Wickland '050 in view of Kalota and Finkelstein or McKedy. It is respectfully submitted that Wickland '050 was filed on October 5, 2000 and Appellants application was filed on September 8, 2000. Therefore, Wickland et al. '050 is not a proper reference under 35 U.S.C. §102(e) because it was filed after Appellants' filing date. Accordingly, this rejection should also be reversed by the Board.

(9) CONCLUSION

In view of the Terminal Disclaimers, arguments and authorities presented above, Appellants respectfully request that the Examiner's action in making and maintaining the numerous rejections of the third Office Action in this matter be reversed and that this application be allowed.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John R. Moses", is written over a horizontal line.

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APPENDIX

1. An enclosure vent adapted to vent hydrogen gas while controlling release of volatile organic compounds from an enclosure containing transuranic waste to an environment surrounding the enclosure while being resistant to corrosion from corrosive materials including chlorinated solvents, hydrochloric acid and nitric acid, the enclosure vent comprising:

a housing defining a chamber therein having a first opening adapted to communicate with said enclosure and a second opening adapted to communicate with the surrounding environment, the housing being made of a nickel, chromium, molybdenum alloy having a resistance to corrosion from said corrosive elements for at least 200 years;

a filter media disposed in said chamber between the first and second openings for venting hydrogen gas from the container, the filter media being a carbon-to-carbon filter media for providing a hydrogen permeability greater than $10E-06$ mol/S/mol fraction weight, a removal of 0.45 micron particles exceeding 99.00% at an air flow capacity less than 200 ml/min., at a pressure differential less than 1.0 inch, and

a seal between the filter media and the housing, the seal consisting of direct engagement between the nickel, chromium, molybdenum alloy of the housing and the carbon-to-carbon filter media.

2. The enclosure vent of claim 1 wherein the housing has a radially extending flange portion adapted to overlie the outer surface of the enclosure and an axially extending portion adapted to

pass through the opening in the enclosure, the axially extending portion including a coupling adapted to attach the housing to the enclosure.

3. The enclosure vent of claim 2 wherein the axially extending portion of the housing includes an annular shoulder spaced from the first and second openings thereof within the chamber for preventing axial movement of the filter media through the first opening of the housing and for sealing with the filter media and wherein the enclosure vent further includes a perforated lid having a plurality of openings, the perforated lid being attached to the housing for preventing axial movement of the filter media out of the second opening of the housing while allowing the passage of hydrogen gas therethrough.

4. The enclosure vent of claim 3, wherein the axially extending portion of the housing is cylindrical.

5. The enclosure vent of claim 3, wherein the axially extending portion of the housing is cylindrical and the coupler adapted to attach the housing to the container is a helical thread around the axially extending portion of the housing.

6. The enclosure vent of claim 3, wherein the support arrangement comprises an annular shoulder having a support surface against which the filter media abuts.

7. The enclosure vent of claim 1, wherein the housing includes an axially extending threaded portion and a radially extending flange portion, with the chamber including an annular shoulder therein for supporting and directly sealing with the filter media, the flange portion supporting a perforated lid made of the same alloy as the housing to cover the filter media while the filter media is supported on the annular shoulder.

8. The enclosure vent of claim 7, wherein the flange portion of the housing has a relieved portion around the chamber enclosed by a radially facing axially extending wall that defines a shelf of a selected shape and wherein the lid has a shape complementing the shape of the shelf for having a press fit within the wall to retain the lid in abutment with the shelf to retain the filter media within the chamber.

9. The enclosure vent of claim 8 further including a gasket disposed adjacent the flange portion adapted to seal between the flange portion and the enclosure.

10. The enclosure vent of claim 8 wherein the enclosure is a container having a stainless steel wall and wherein the flange portion of the housing is adapted to be fixed to the lid with a peripheral weld.

11. The enclosure vent of claim 9 wherein the enclosure with which the enclosure vent is adapted to be used is a stainless steel container with a stainless steel lid and wherein the enclosure vent is adapted to be welded to the lid.

12. The enclosure vent of claim 1 wherein the a nickel, chromium, molybdenum alloy of the housing has an average corrosion rate no greater than 2 mils per year when immersed in hydrochloric acid at a concentration of 2.0 to 2.5% by weight and a temperature of 90E; an average corrosion no greater than 2 mil per year when immersed in a solution of nitric acid and 15.8% hydrochloric acid at a concentration of 8.8% by weight and a temperature of 52EC.

13. The enclosure vent of claim 12 wherein the average corrosion rate of the a nickel, chromium, molybdenum for hydrochloric acid is less than 1 mil per year; the average corrosion rate of the alloy for nitric acid is less than 1 mil per year, and the average corrosion rate of the alloy for nitric acid plus 15.8% hydrochloric acid is no greater than 4 mils per year.

14. (Cancelled)

15. The enclosure vent of claim 19 wherein the enclosure vent includes a perforated lid covering the filter media which is fixed over the chamber by direct contact with the housing.

16. The enclosure vent of claim 15 wherein the direct contact is a press fit between the lid and housing.

17. The enclosure vent of claim 15 wherein the direct contact is a weld.

18. The enclosure vent of claim 1 wherein the enclosure vent is adapted for use with a stainless steel enclosure.

19. An enclosure vent adapted to vent hydrogen gas while controlling release of volatile organic compounds from an enclosure containing transuranic waste to an environment surrounding the enclosure while being resistant to corrosion from corrosive materials including chlorinated solvents, hydrochloric acid and nitric acid, the enclosure vent comprising:

a housing defining a chamber therein comprising a first opening adapted to communicate with said enclosure and a second opening adapted to communicate with the surrounding environment, the housing being made of a nickel, chromium, molybdenum alloy having a resistance to corrosion from said corrosive elements for at least 200 years, and

a unitary filter media disposed in said chamber between the first and second openings for venting hydrogen gas from the container, the filter media comprising a carbon-to-carbon filter for providing a hydrogen permeability greater than $10\text{E-}06$ mol/S/mol fraction weight, a removal of 0.45 micron particles exceeding 99.00% at an air flow capacity less than 200 ml/min., at a pressure differential less than 1.0 inch, the unitary filter media being sealed with the housing by direct engagement with an annular edge on the housing which engages a bottom surface of the filter media to provide a carbon-to-carbon/nickel, chromium, molybdenum alloy knife edge seal between the filter media and housing.

20. The enclosure vent of claim 19 wherein the enclosure vent is adapted for use with a stainless steel enclosure.